Gregory R. Kriehn

Professor, LCOE Honors Director

California State University, Fresno — 559-278-8811 (P)
Lyles College of Engineering — 559-801-7792 (C)
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Objective

To provide a dynamic teaching and research environment in RF Photonics,
Adaptive Optical Signal Processing, Opto-electronics, and Unmanned Aircraft Systems

I. Professional Education

University of Colorado – Boulder, CO
> **Doctor of Philosophy** in Electrical Engineering (August, 2003)
> Thesis: Coherent Optical Signal Processing for Broadband Adaptive
> Phased-Array Antennas using the BEAMTAP Algorithm

> **Master of Science** in Electrical Engineering (December, 1999)

Rose-Hulman Institute of Technology – Terre Haute, IN
> **Bachelor of Science** in Physics and Applied Optics (May, 1997)

II. Professional Experience and Appointments

California State University, Fresno – Fresno, CA

08/14 - Date   **Full Professor** in Electrical and Computer Engineering

Engaged in providing a leadership role in graduate and undergraduate teaching, the development of new lecture and laboratory coursework, and the implementation of current design tools and methodologies in Electrical and Computer Engineering; involved in research and scholarly activities in RF Photonics, Adaptive Optical Signal Processing, Opto-Electronics, and Unmanned Aircraft Systems; responsible for supervising student projects and research at both the graduate and undergraduate level. Responsible for taking a leadership role within the department, college, and university.

01/09 - Date   **Honors College Director** for the Lyles College of Engineering

Responsible for: Directing and coordinating the Lyles College of Engineering's Honors Program; Chair of the LCOE Honors College Committee; leading marketing and recruitment efforts; coordinating procedures for admission or denial of applicants; providing seminar courses for LCOE Honors College recipients; coordinating efforts with students in Academic Excellence, Leadership, and Professional Service; providing honors student advising; maintaining records and tracking of students; leading honors program planning and curriculum development; coordinating program reviews and assessment.

08/09 - 07/14   **Associate Professor** in Electrical and Computer Engineering

Engaged in providing a leadership role in graduate and undergraduate teaching, the development of new lecture and laboratory coursework, and the implementation of current design tools and methodologies in Electrical and Computer Engineering; involved in research and scholarly activities in RF Photonics, Adaptive Optical Signal Processing, Opto-Electronics, and Unmanned Aerial Systems; responsible for supervising student projects and research at both the graduate and undergraduate level.

08/07 - 08/08   **Graduate Coordinator** for the M.S. in Engineering – Electrical Option

Responsible for: Directing and coordinating the graduate program; leading marketing and recruitment efforts; coordinating procedures for admission or denial of graduate program applicants; providing initial graduate student advising; maintaining departmental graduate student records and tracks all students in the program; handling graduate student petitions and appeals; leading graduate program planning and curriculum development; coordinating program reviews and assessment.

08/03 - 05/09   **Assistant Professor** in Electrical and Computer Engineering

Engaged in graduate and undergraduate teaching, the development of new lecture and laboratory coursework, and the implementation of current design tools and methodologies in Electrical and Computer Engineering; involved in research and scholarly activities in optical signal processing, optical communication, and opto-electronics; responsible for supervising student projects and research at both the graduate and undergraduate level.

University of Colorado, Boulder – Boulder, CO

07/04 - 08/04   **Visiting Assistant Professor** in Electrical Engineering

Collaborated with researchers in opto-electronics; worked on coherent optical array processing and other activities related to RF photonics, including photon echo optical processing; performed duties and responsibilities in my area of expertise as assigned by the University of Colorado and the Electrical and Computer Engineering Department; co-wrote a number of papers, in addition to a proposal to the National Reconnaissance Office.

01/98 - 08/03   **Graduate Research Assistant** in Electrical Engineering

Studied algorithms, architectures, and systems involving adaptive techniques for optical processing of RF phased-array antennas; analyzed and experimentally demonstrated an adaptive photonic phased-array processor using acousto-optics, a traveling-fringes detector, and a photorefractive crystal to form a squint-free beam toward a broadband signal of interest and simultaneously null broadband jamming signals.

LEHKO Innovation – Fresno, CA
> 06/13 - 08/13 **Consultant**
>> Responsible for interfacing LED driver circuits with a microcontroller.

Toyon Research Corporation – Santa Barbara, CA
> 05/08 - 05/12 **Consultant**
>> Responsible for exploring the applicability of optical signal processing techniques for RADAR applications using phased-array antennas.

Pelco – Fresno, CA
> 03/05 - 05/07 **Consultant & Faculty Researcher**
>> Responsible for developing a free-space optical communications link for evaluating wireless transmission of video signals using optics

III. Teaching Experience

California State University – Fresno, CA
> 08/03 - Date **Graduate Courses Taught**
>> ECE 245 – Communications Engineering
>> ECE 257 – Optical Communication and Lasers
>> ECE 290 – Independent Study
>> ECE 291T – Optical Systems
>> ECE 298 – Graduate Project

> 08/03 - Date **Undergraduate Courses Taught**
>> ECE 1 – Introduction to Electrical and Computer Engineering
>> ECE 70 – Computational Programming for Engineers
>> ECE 71 – Engineering Computations in C
>> ECE 72 – Introduction to Electrical and Computer Engineering Tools[*]
>> ECE 85 – Digital Logic Design
>> ECE 90 – Principles of Electrical Circuits
>> ECE 90L – Principles of Electrical Circuits Lab
>> ECE 120L – Digital Systems Laboratory
>> ECE 124 – Signals and Systems
>> ECE 155 – Control Systems
>> ECE 171 – Quantum Electronics
>> ECE 186A – Senior Design I
>> ECE 186B – Senior Design II
>> ECE 190 – Independent Study
>> ECE 191T – Optical Systems
>> ECE 191T – Electrical and Computer Engineering Clinic

> [*]Formerly also Taught as ECE 2

08/03 - Date   **Lyles College of Engineering Courses Taught**

ENGR 1H – Honors Seminar I
ENGR 2H – Honors Project I
ENGR 3H – Honors Seminar II
ENGR 4H – Honors Project II
ENGR 1T – Honors Special Topics

STEM Institutes – Matlab; Robotics; Renewable Energy

All teaching experience at California State University, Fresno occurred either as a Full Professor, Associate Professor, or Assistant Professor, between 08/03 to Date.

08/03 - Date   **New Courses Developed/Major Course Redesigns**

ECE 1 - Introduction to Electrical and Computer Engineering
ECE 1L - Introduction to Electrical and Computer Engineering Lab
ECE 70 - Engineering Computations in C
ECE 71 - Algorithms and Data Structures
ECE 72 - Introduction to Electrical and Computer Engineering Tools
ECE 85L - Digital Logic Design Laboratory
ECE 90L - Circuits and Systems Laboratory
ECE 103 - Professional Development Skills
ECE 191T/291T - Optical Systems
ECE 191T - Engineering, People, & Markets
ECE 191T - Electrical and Computer Engineering Clinic
ENGR 1/3H - Honors Seminar
ENGR 2/4H - Honors Project
ENGR 101 - Applied Engineering Analysis I
ENGR 181W - Technology Entrepreneurship

The courses listed have either undergone significant course and/or laboratory redesigns (constituting a change of up to 80% of the course material), or are newly created courses.

University of Colorado – Boulder, CO

08/97 - 07/03   **Graduate Courses Taught**

ECEN 5016 – Fundamentals of Photonics[**]
ECEN 5385 – Optical Properties of Materials[*]
ECEN 5606 – Advanced Optics Lab[†]
ECEN 6156 – Physical Optics[*]

08/97 - 07/03   **Undergraduate Courses Taught**

ECEN 4006 – Undergraduate Optics Lab[‡]

[**]Taught as a Guest Lecturer (1-4 class periods)
[†]Taught as a Co-Teaching Assistant (2 semesters)
[‡]Taught as a Full Teaching Assistant (1 semester)

All teaching experience at the University of Colorado, Boulder occurred as a GRA or a TA.

IV. Assigned Time by Semester

Assigned time duties are broken down by semester – also included is the type/number for each class, the course name, enrollment, and whether the class involves web-based instruction, web-assisted instruction, and/or distance learning.

Notes:

ECE = Electrical and Computer Engineering   EE = Electrical Engineering (Graduate Courses)

Web-Based = Internet- and computer-based content/tools constitute a major portion of the class.
Web-Assisted = Internet- and computer-based content/tools are used to assist teaching the class.

Spring 2017

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Alg. and Data Structures	4	N/A	N	Y	N
ECE 186B	Senior Design II	3	N/A	N	N	N
ENGR 2/4H	Honors Project	3	N/A	N	N	N

3 Units of Release Time Assigned for NASA MUREP Grant

Fall 2016

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 70	Comp. Prog. for Eng.	3	31	N	Y	N
ECE 124	Signals and Systems	4	47	N	Y	N
ECE 186A	Senior Design I	1	16	N	N	N
ENGR 1/3H	Honors Seminar	3	14	N	N	N

Spring 2016

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 85L	Dig. Logic Des. Lab	2	14	N	N	N
ECE 171	Quantum Electronics	3	10	N	N	N
ECE 190	Independent Study	N/A	1	N	N	N
ENGR 2/4H	Honors Seminar	3	15	N	N	N

3 Units of Release Time Assigned for NASA MUREP Grant

Fall 2015

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 70	Eng. Computations	3	33	N	Y	N
ECE 71	Eng. Computations	3	32	N	Y	N
ECE 124	Signals and Systems	4	40	N	Y	N
ECE 190	Independent Study	N/A	1	N	N	N
ENGR 1/3H	Honors Seminar	3	17	N	N	N

Spring 2015

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 85L	Dig. Logic Des. Lab	2	20	N	N	N
ECE 155	Control Systems	3	37	N	N	N
ECE 290	Grad. Ind. Study	N/A	1	N	N	N
ECE 298	Graduate Project	N/A	1	N	N	N
ENGR 2/4H	Honors Seminar	3	12	N	N	N

3 Units of Release Time Assigned for UAS Research

Fall 2014

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Eng. Computations	3	39	N	Y	N
ECE 72 (2)*	Intro. to ECE Tools	4	63	N	Y	N
ECE 190	Independent Study	N/A	4	N	N	N
ECE 191T/257	Optical Comm.	3	6	N	N	N
ECE 290	Grad. Ind. Study	N/A	1	N	N	N
ENGR 1/3H	Honors Seminar	3	12	N	N	N

*Teaching 2 Sections of ECE 72.

Spring 2014

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 155	Control Systems	3	36	N	Y	N
ECE 171	Quantum Electronics	3	7	N	N	N
ECE 190	Independent Study	N/A	2	N	N	N
ECE 290	Grad. Ind. Study	N/A	1	N	N	N
ECE 298	Graduate Project	N/A	1	N	N	N
ENGR 2/4H	Honors Project	3	8	N	N	N

3 Units of Release Time Assigned for UAS Research

Fall 2013

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1	Introduction to ECE	2	24	N	Y	N
ECE 71	Engin. Computations	3	39	N	Y	N
ECE 72	Intro. to ECE Tools	2	31	N	Y	N
ECE 186B	Senior Design II	3	11	N	N	N
ECE 190	Independent Study	N/A	1	N	N	N
ENGR 1/3H	Honors Seminar	3	9	N	N	N

Spring 2013

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 72	Intro. to ECE Tools	2	33	N	Y	N
ECE 155	Control Systems	3	22	N	Y	N
ECE 186A	Senior Design I	1	9	N	N	N
ECE 190	Independent Study	N/A	2	N	N	N
ENGR 2/4T	Honors Project	3	7	N	N	N

3 Units of Release Time were assigned for Unmanned Aerial Systems Activities.

Fall 2012

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (3)*	Intro. to ECE	4	55	N	Y	N
ECE 72	Intro. to ECE Tools	2	20	N	Y	N
ECE 171	Quantum Electronics	3	20	N	N	N
ENGR 1/3T	Honors Seminar	3	7	N	N	N

*Teaching 3 Sections of ECE 1.

Spring 2012

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 2	Intro. to ECE Tools	2	30	N	Y	N
ECE 85	Digital Logic Design	3	41	N	Y	N
ECE 155	Control Systems	3	30	N	Y	N
ECE 190	Independent Study	N/A	2	N	N	N
ENGR 2/4T	Honors Project	3	8	N	N	N

Fall 2011

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 2	Intro. to ECE Tools	2	33	N	Y	N
ECE 71	Engin. Computations	3	38	N	Y	N
ECE 90L	Prin. of Elec. Lab	2	18	N	Y	N
ECE 124	Signals & Systems	3	33	N	Y	N
ECE 190	Independent Study	N/A	1	N	N	N
ENGR 1/3T	Honors Seminar	3	9	N	N	N

Spring 2011

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1	Intro. to ECE	2	26	N	Y	N
ECE 2	Intro. to ECE Tools	2	26	N	Y	N
ECE 155	Control Systems	3	27	N	Y	N
ECE 190	Independent Study	N/A	5	N	N	N
ENGR 1T	Honors Seminar	3	9	N	N	N

2 Units of Release Time were Assigned for Unmanned Aerial Systems Activities.

Fall 2010

Fall 2010 on Sabbatical Leave

Spring 2010

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Engin. Computations	3	39	Y	Y	N
ECE 85	Digital Logic Design	3	35	N	Y	N
ECE 186B	Senior Design II	3	10	N	Y	Y
ECE 190	Independent Study	N/A	2	N	N	N
EE 298	Graduate Project	N/A	1	N	N	N
ENGR 1T	Honors Seminar	3	9	N	N	N

Fall 2009

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Engin. Computations	3	42	Y	Y	N
ECE 85	Digital Logic Design	3	34	N	Y	N
ECE 186A	Senior Design I	1	12	N	Y	Y
ECE 190	Independent Study	N/A	1	N	N	N
ECE 191	ECE Clinic	2	8	N	Y	N
ENGR 1T	Honors Seminar	3	9	N	N	N

Spring 2009

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1	Intro. to ECE	2	28	Y	Y	N
ECE 71	Engin. Computations	3	39	Y	Y	N
ECE 90L	Prin. of Elec. Lab	2	12	N	N	N
ECE 190	Independent Study	N/A	6	N	N	N
EE 290	Grad. Indep. Study	N/A	2	N	N	N
ECE 298	Graduate Project	N/A	1	N	N	N
ENGR 1T	Honors Seminar	3	5	N	N	N

Fall 2008

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (2)*	Intro. to ECE	2	67	Y	Y	N
ECE 1L (4)**	Intro. to ECE Lab	4	67	Y	Y	N
ECE 124	Signals and Systems	4	31	N	Y	N
ECE 290	Independent Study	N/A	2	N	N	N
ECE 298	Graduate Project	N/A	2	N	N	N

3 Units of Release Time were assigned to the Provost's Research Activity Award (RAA).
*Teaching 2 Sections of ECE 1. **Teaching 4 Sections of ECE 1L.

Spring 2008

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (1)*	Intro. to ECE	1	26	Y	Y	N
ECE 1L (2)**	Intro. to ECE Lab	3	26	Y	Y	N
ECE 186B	Senior Design II	3	11	N	Y	N
ECE 190	Independent Study	N/A	1	N	N	N
ECE 290	Grad. Indep. Study	N/A	1	N	N	N

3 Units of Release Time were assigned to Graduate Coordinator responsibilities.
3 Units of Release Time were assigned to Graduate Faculty/Program Enhancement
*Teaching 1 Section of ECE 1. **Teaching 2 Sections of ECE 1L.

Fall 2007

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (2)*	Intro. to ECE	2	64	Y	Y	N
ECE 1L (4)**	Intro. to ECE Lab	4	64	Y	Y	N
ECE 191T/291T	Optical Systems	3	3	N	Y	N
ECE 186A	Senior Design I	1	8	N	Y	N

3 Units of Release Time were assigned to Graduate Coordinator responsibilities.
*Teaching 2 Sections of ECE 1. **Teaching 4 Sections of ECE 1L.

Spring 2007

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1	Intro. to ECE	1	22	Y	Y	N
ECE 1L	Intro. to ECE Lab	2	22	Y	Y	N
ECE 120L	Comp. Sys. Lab	2	16	N	Y	N
EE 257	Optical Comm/Lasers	3	6	N	Y	N
EE 298	Graduate Project	N/A	2	N	N	N

3 Units of Release Time were provided by a Graduate Faculty/Program Enhancement Award

Fall 2006

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (2)*	Intro. to ECE	2	68	Y	Y	N
ECE 1L (4)**	Intro. to ECE Lab	4	68	Y	Y	N
ECE 120L	Comp. Sys. Lab	2	17	N	Y	N
ECE 186B	Senior Design II	3	12	N	Y	N
EE 290	Grad. Indep. Study	N/A	2	N	N	N

*Teaching 2 Sections of ECE 1. **Teaching 4 Sections of ECE 1L.

Spring 2006

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 120L	Comp. Sys. Lab	2	18	N	Y	N
ECE 171	Quantum Electronics	3	10	N	Y	N
ECE 186A	Senior Design I	1	12	N	Y	N
EE 245	Comm. Engineering	3	16	N	Y	N
EE 290	Grad. Indep. Study	N/A	3	N	N	N
EE 298	Graduate Project	N/A	1	N	N	N

2 Units of release time were provided for ABET preparation.

Fall 2005

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 85	Digital Logic Design	3	77	N	Y	N
ECE 120L	Comp. Sys. Lab	2	19	N	Y	Y
ECE 186B	Senior Design II	3	9	N	Y	Y

3 Units of Release time were provided by the Provost Award 2005.
1 Unit of Release time was provided to help with ABET preparation.

Spring 2005

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1	Intro. to ECE	2	25	N	Y	N
ECE 85*	Digital Logic Design	4	60	N	Y	N
ECE 120L	Comp. Sys. Lab	2	13	N	Y	N
ECE 186A	Senior Design I	1	9	N	Y	Y
ECE 190	Independent Study	N/A	1	N	N	N
EE 257	Optical Comm/Lasers	3	5	N	N	Y

*1 Extra Unit of Assigned Time Provided for Large Class Size.

Fall 2004

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Engin. Computations	3	39	Y	Y	N
ECE 85*	Digital Logic Design	4	68	N	Y	N
ECE 90	Princ. of Elec. Circuits	3	32	N	Y	N
ECE 90L	Prin. of Elec. Lab	2	8	N	Y	N

*1 Extra Unit of Assigned Time Provided for Large Class Size.

Spring 2004

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 85	Digital Logic Design	3	44	N	Y	N
ECE 90	Prin. of Elec. Circ. Lab	2	17	N	N	N
ECE 120L	Computer Systems Lab	2	18	N	Y	N

3 Units of release time were provided, as it was my first probationary year.
1 Unit of release time was provided to help with ABET preparation.

Fall 2003

Type/Number	Course Name	Units	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Engin. Computations	3	32	Y	Y	N
ECE 85	Digital Logic Design	3	33	N	Y	Y
EE 257	Optical Comm/Lasers	3	5	N	N	N

3 Units of release time were provided, as it was my first probationary year.

V. Research Grants and Contracts

Optical Expertise Includes: Lasers, Optics, Acousto-Optics, Photorefractives, Dynamic Holography, Opto-Electronics and Electro-Optics, Optical Systems and Integration, Opto-Electronic Feedback Systems, Electronics, Filter Design, and RF and Microwave Circuit Design.

Electrical and Computer Expertise Includes: Unmanned Aerial Systems, Signals and Systems, Communications, Microcontrollers, Control Systems, Electric Circuits and Filter Design, Digital Logic Design, C and Matlab Programming.

Grants and Contracts Awarded

External Grants and Contracts Funded

NASA Minority University Research and Education Program 2016
Rising Data: MUREP for Community College Curriculum Enhancement

University of California Agricultural and Natural Resources 2014
Evaluating and Extending the Use of Small, Multi-Rotor Unmanned Aerial Vehicles (UAV's) as a Crop Monitoring Tool

Edwards Air Force Base 2013
Unmanned Aerial Systems – Hexa/Quadcopter Project

NSF Direct Assessment of Student Learning Outcomes via Quant. Measures 2011
LCOE Direct Assessment Grant

California Space Grant UROP 2011
3D UAS Simulator

Edwards Air Force Base 2010
Unmanned Aerial Vehicle/Systems Project III

Edwards Air Force Base 2009
Unmanned Aerial Vehicle/Systems Project II

Edwards Air Force Base 2009
Optical Communication Project

Edwards Air Force Base 2008
Unmanned Aerial Vehicle/Systems Project

Enhancing Learning and Teaching 2008
    Interdisciplinary Innovation Teams in Anthropology, Engineering, and Entrepreneurship

Edward's Air Force Base 2007
    Optical Communications Laboratory Development (2)

Edward's Air Force Base/Knowledge Workers 2006
    Multi-Channel Fiber-Optic Communication Link
    Grant Writing Investment

Pelco 2005
    Optical Free-Space Communication System for Video Signals II

Pelco 2005
    Optical Free-Space Communication System for Video Signals I

Colorado Photonics, Inc. 2005
    Equipment Grant/Donation for the Optical Communications Laboratory

Edward's Air Force Base/Knowledge Workers 2005
    Design of a Compass 315M Laser Control Panel
    Free-space Opto-electronic Communication Link

Internal Grants Funded

IRA IEEE Student Chapter 2016
Funding for IEEE Activities

Multiple rGrant Awards 2016
Funding for Undergraduate Student UAS Research

IRA USRT Funding 2015
Funding for Unmanned Systems Research Team

IRA IEEE Student Chapter 2015
Funding for IEEE Activities

IRA IEEE Student Chapter 2014
Funding for IEEE and UAS Activities

URG Holography 2014
    Fourier Optics and Holography Research Project

IRA IEEE Student Chapter 2013
    Travel funds for IEEE Conferences

IRA CSU-LSAMP Microgravity Flight Team 2012
    CSU-LSAMP Microgravity Flight Team Project for NASA

IRA IEEE Unmanned Aerial Systems Project 2012
    Unmanned Aerial Vehicle/Systems Project

CSU-LSAMP Research Award 2011
    Holography Research

URG Signals & Systems 2011
Signals and Systems Project I

URG Signals & Systems 2011
Signals and Systems Project II

URG Signals & Systems 2011
Signals and Systems Project III

URG Signals & Systems 2011
Signals and Systems Project IV

IRA IEEE Unmanned Aerial Systems Project 2011
Unmanned Aerial Vehicle/Systems Project I

IRA IEEE Unmanned Aerial Systems Project 2011
Unmanned Aerial Vehicle/Systems Project II

IRA Optics Research Team 2011
Holography Research

URG Optics Research 2009
High-Intensity Tri-Color LED Lighting System I

URG Optics Research 2009
High-Intensity Tri-Color LED Lighting System II

IRA IEEE Unmanned Aerial Systems Project 2009
Unmanned Aerial Vehicle/Systems Project

IRA IEEE RFID Library System Project 2009
RFID Project for IEEE Student Chapter

IRA LCOE Honors Project 2009
Lyles College of Engineering Honors Project I

IRA LCOE Honors Project 2009
Lyles College of Engineering Honors Project II

IRA LCOE Honors Project 2009
Lyles College of Engineering Honors Project III

Research Activity Award (RAA) 2008
BEAMTAP Proposal for Adaptive Antenna Array Processing

IRA IEEE Unmanned Aerial Systems Project 2008
Unmanned Aerial Vehicle/Systems Project

URG Fourier Optics and Holography 2010
Fourier Optics and Holography Research Project I

URG Fourier Optics and Holography 2010
Fourier Optics and Holography Research Project II

IRA IEEE Unmanned Aerial Systems Project 2010
Unmanned Aerial Vehicle/Systems Project

IRA LCOE Honors Project 2010
Lyles College of Engineering Honors Project Funding

CSU-LSAMP Research Grant 2010
Fourier Optics and Holography Research I

CSU-LSAMP Research Grant 2010
Fourier Optics and Holography Research II

Graduate Faculty/Program Enhancement 2008
Graduate Research

Graduate Faculty/Program Enhancement Award 2007
Optical Systems Course/Laboratory Development

Provost's Award 2005
Polarization-Angle, Read-Write Multiplexing for Wide-Angular Aperture Holography

Faculty Development 2004
Optimization of Polarization-Angle, Read-Write Multiplexing for Holography
Coherent 315M-100 Green DPSS Laser Systems

Funding for Laboratory Development

Lyles College of Engineering Laboratory Support 2012
Optical Communications Laboratory

Provost Laboratory Supplement to College of Engineering 2006
Optical Communications Laboratory
Developed undergraduate and graduate optical lab experiments
Introduction to Electrical and Computer Engineering
Developed a new Robotics lab for incoming Freshman ECE students

Departmental Curriculum Development 2006
Introduction to Electrical Circuits Laboratory
Re-wrote lab manual and incorporated new lab experiments
Digital Systems Laboratory
Co-wrote lab manual and incorporated new lab experiments

Scholarships Awarded

Provost's Graduate Scholarships 2008
Graduate Scholarships Awarded to New Graduate Students

Private Contracts & Consulting

LEHKO Innovation 2013
LED Driver Integration with a Digital Microcontroller

Toyon Research Corporation 2008-2012
BEAMTAP White Paper & Phase I Implementation

Pelco 2005-2007
Free-Space Optical Communication Video Link

VI. Graduate and Undergraduate Student Research

Formal Graduate Student Research Projects & Independent Studies

Pandey, Ankit – Fall 2014 - Spring 2015
Yadav, Pappu – Spring 2013 - Spring 2014
Fagerstrom, Sven – Spring 2009
Pannu, Samardeep Singh – Fall 2008
Vang, Jimmy – Fall 2008
Pittenger, Tom – Fall 2008 - Spring 2009 - Spring 2010
Singh, Manpriya – Spring 2008 - Fall 2008
Papavasiliou, Nell – Fall 2006
Van Peteghem, Gerald – Spring 2006 - Fall 2006
Leung, Chi Yan Daniel – Spring 2006
Tsai, Yun-Hsuan – Spring 2006

Note: All Graduate Research Projects & Independent Studies have occurred an overload

Formal Undergraduate Student Research Projects & Independent Studies

Morley, Nicholas – Fall 2015 - Spring 2016
Castillo, Andres – Fall 2014
Verrinder, Paul – Fall 2014
Baeza, Jorge – Fall 2014
Sakib, Khandakar – Spring 2014
Bigalke, Lauren – Spring 2014
Hoffman, Carson – Fall 2013
Livingston, Christopher – Spring 2013
Sanchez, Estevan – Spring 2012
McAtee, Joshua – Fall 2011
Yingst, Nicholas – Spring 2011
Updyke, Katheryn – Spring 2011 - Spring 2012
Vang, Tou – Spring 2011
Martinez, Ismael – Spring 2011
Combs, Elizabeth – Spring 2011
Cook Jaon – Spring 2010
Courrejou, Timothy – Fall 2009 - Spring 2010
Bryan, Jake – Spring 2009
Flerchinger, Jonathan – Spring 2009
Lopez, Alfred – Spring 2009

Urbieta, Victor – Spring 2009
Bui, Thanh Van – Spring 2009
Wyman, Kirk – Spring 2009
Hibler, Chris – Spring 2008
Van Peteghem, Gerald – Spring 2005

and numerous additional undergraduate research students (formal and informal) in optics, holography, and unmanned aircraft systems, supported by Louis Stokes Alliances for Minority Participation (LSAMP) Awards, Instructionally Related Activity Awards, and rGrant Awards.

Note: All Undergraduate Research Projects & Independent Studies have occurred an overload

California State University – Fresno, CA

08/13 - Date **Example Graduate Level Research & Projects**

Quad/Hexacopter Unmanned Aircraft System for Agriculture

This research seeks to design a Quad/Hexacopter Unmanned Aerial System for agriculture applications. Integration of GPS, flight controls, gimbal, camera, and a data link will allow for the integration of moisture sensors, multi-spectral imaging, and monitoring of crop health. Independent control of the gimbal will allow for flexibility of the quad/hexacopter flight controls when performing imaging operations with the camera system.

Unmanned Aerial Vehicles/Systems

This research seeks to develop an Unmanned Aerial System (UAS) capable of target tracking via a gimbal and a laser. The UAV will provide a video feed of the the object and surrounding area, and will incorporate GPS, gyroscope, accelerometer, and vibration sensors. Project goals include the education of graduate and undergraduate students, providing professional development opportunities for high school educators and students, and providing enhanced laboratory development capabilities for California State University, Fresno.

Unmanned Aerial Vehicle Internet Based Flight Control System

This research implemented a UAV utilizing a low-speed Internet connection through a cellular phone to allow a pilot on the ground to manually fly an aircraft in real-time. Normally small UAVs are traditionally flown using 25 MHz, 72 MHz, or 2.4 GHz model airplane transmitters, opposed to relying upon a cellular network for flight controls.

Digital Fiber Optic Communication Data Link

This research seeks to design a digital fiber optic communication data link supporting 10/100 Mbps data rates as a precursor to creating a Gbps system. The research will interface Ethernet TCP/IP data with optical transceivers and a digital microprocessor development board.

Orthogonal Frequency Division Multiplexing (OFDM)

This Master's project research detailed the implementation and observation of 512 random 16-QAM (Quadrature Amplitude Modulation) symbols mapped to a Gray code scheme as the data is transmitted by an OFDM technique over different noise variance values. The simulation was implemented using Matlab software, and symbol error and bit error rates were studied based upon Monte Carlo simulations.

Remote Microcontroller-Based Appliance Controller

This research seeks to develop a remote microcontroller-based appliance controller with a status check and feedback monitoring system. It will also allow for remote access and control of the appliance through cell phone technology, and provide a timing circuit to change the status of the appliance at specific times. The project seeks to blend optical, wireless, and wired communication techniques and technologies.

Polarization-Angle, Read-Write Multiplexing for Holography

This research sought to optimize the geometry for simultaneous reading and writing of holographic information within an anisotropic photorefractive crystal, where the optical reading and writing beams contain a wide angular aperture and are orthogonally polarized. The work was based upon the equal-curvature, parallel-tangents condition, which can be used for holographic data storage and radio frequency (RF) signal processing.

Fiber-Optic Communication and Multiplexing Link

This research project seeks to create a fiber-optic communications link using time-division multiplexing through the use of fiber-optic laser-diode transceivers and several kilometers of fiber optic cable. Interface with the fiber-optic transceivers is being performed digitally using a PCB layout for pre- and post-amplification, analog-to-digital and digital-to-analog conversion, and timing circuits using PIC microcontrollers. The goal is to complete a complete end-to-end fiber-optic link using multiple channels.

Optical Free-Space Communication System for Video Signals

This research project created an optical free-space communication system for video signals in conjunction with Pelco. Phase I funding was provided in Fall 2005 for an initial proof of concept of the system, followed by Phase II funding to field a prototype starting Spring 2005. All optical design and implementation for the research was performed at California State University, Fresno, with Pelco providing electronic expertise and manufacturing capabilities.

Digital Image Processing

This project investigated several common techniques for manipulating digital images in the spatial and spatial frequency domains. Techniques such as conversion from color mode to gray mode, adjustment of brightness, creation of threshold images, addition of random noise, application of median filters, generation of histograms, application of contrast stretching, and application of spatial filters were implemented. In addition, Fourier Transform techniques were used to smooth and sharpen images.

Free-space Opto-electronic Communication Link for Audio Signals

This graduate class research project was designed to instruct graduate students about engineering research methodologies, including examination of the theoretical background of a system, specification of components and their parameters, cost analysis and purchasing, experimentation, integration, debugging, and analysis of experimental results. In the process, a free-space, opto-electronic communication link was designed and implemented.

08/03 - Date **Example Undergraduate Level Research Projects**

Hexacopter Swarm Formation System

This project seeks to develop a swarm of hexacopters in a GPS deprived environment. The swarm will allow slave hexacopters to follow a leader using ultra-wideband signal information from a high-frequency embedded processor, and will synchronize altitude and/or latitude and longitude information between the hexacopters.

NASA MUREP Summer Research and Community College Workshop

This project involved undergraduate student researchers creating tutorials and videos for building quadcopter kits for community college curriculum development. Student researchers also took a hands-on approach to teaching during the Summer 2016 workshop. Successful flight tests were conducted by all community college professors.

Embedded Low-Power Sensor System with for Agriculture

This project involved the creation of a low-power embedded sensor platform using a TI microcontroller to gather temperature, humidity, and soil moisture data in almond and pistachio fields. A custom PCB was designed and created by the students to integrate the components together for field testing, in addition to a custom power board for long term deployment.

64 Tri-Color LED Display with Color Blending

This project developed a 64 tri-color LED display with color blending using a PIC16F microcontroller and Maxim LED shift register drivers onto a PC board. The purpose of the project is to provide an educational experience to undergraduate and graduate students, and to develop a demonstration board that can be used by the Electrical and Computer Engineering Department. The project has been highly successful.

Pelco 2D Tri-Color LED Array

Under contract with Pelco, two undergraduate Electrical and Computer Engineering students successfully designed a 2D tri-color LED Array controlled with a serial link via RS232 during Fall 2012 - Summer 2013. The project was designed specifically as an LED calibration light source for Pelco's CCD camera systems. TLC5940 LED shift register drivers were used in conjunction with the tri-color LEDs, with Pulse-Width Modulation for individual intensity control of each LED. A PCB board was also designed for Pelco after the initial prototype was developed.

NASA Microgravity Flight Team Experiment

This research sought to address the vision declination that can occur in astronauts after short and long term space missions. A flight test and experiment was proposed for NASA's Reduced Gravity Aircraft (The "Vomit Comet") by testing the ocular forces of Ovis Aries in microgravity. Successful experimentation was performed at Fresno State.

Holography

Undergraduate student researchers have researched reflection and transmission holograms for optical holography experiments. Students developed holographic plates that have been exposed to an interference pattern between light scattered off an object and a reference beam. Results have been adapted into the Optical Systems Laboratory in the Electrical and Computer Engineering Department at Fresno State.

Control Systems

Undergraduate student researchers created an experimental second-order feedback control system with variable gain and damping stages as a research project to demonstrate Control Systems concepts to the lecture class. Theory, design, and implementation of the control system was successfully performed by the students.

Signals and Systems

Undergraduate student researchers created a hardware implementation of analog and digital Laplace and Fourier Transforms as a way of analyzing and demonstrating electrical signals and systems. Experiments demonstrating convolution were also performed.

NEStalgia Project

An undergraduate student researcher designed and built a MIDI controlled synthesizer that emulated the audio processing unit (APU) of the original Nintendo Entertainment System (NES). The project emphasized circuit design of the entire product development of the NES system, as well as programming microprocessors in C. A successful demonstration of the MIDI synthesizer was performed.

Fourier Optics and Holography

Undergraduate student researchers performed two-dimensional beam propagation simulations using the Fourier Transfer Function of Free Space to examine the Fresnel and Fraunhofer diffraction regions for various apertures. Results of the simulations were verified in the laboratory, and were used as a step toward Fourier Optics and Holography experiments.

California Space Grant UROP Scholarship Research

An undergraduate student researcher received a 2010-2011 California Space Grant UROP Scholarship, and designed a 3D simulator for the Unmanned Aerial Systems project based upon actual flight test data taken in the field. The 3D simulator displayed the flight trajectory of the UAS, along with the dynamic pointing angle of the gimbal.

High-Intensity LED Lighting System

Undergraduate student researchers created a high-intensity full color spectrum LED lighting system using tri-color LEDs for home environments. The outcome of the project led to one of the student researchers creating a start-up company, LEHKO Innovation. The technology has been patented, and is now being licensed to several companies.

Sensor Fusion and Integration for the UAV Project

Undergraduate student researchers integrated an Atto-Pilot, Sonar Range Finder, and Angle-of-Attack Sensor into the Unmanned Aerial Vehicle Project, allowing for semi-autonomous flight.

IEEE RFID Library Tagging System

Undergraduate student researchers developed an automatic RFID tagging and e-mail system for the IEEE student library at Fresno State using RFID communication protocols and a GNU Radio subsystem.

Design of a Compass 315M Laser Control Panel

This research seeks to design the interface electronics to a Coherent analog controller for the 315M laser head using a PCB layout, and includes fault indicators as well as the initialization logic for the laser head. The initialization logic will indicate when the laser has stabilized, the selected power level has been achieved and locked in, and will provide an LCD display indicating the current operating power of the laser. The control panel will also monitor the laser diode current and current control voltage, as necessary.

Fiber Optic Communication Link

Using industrial fiber optic telecommunication equipment (optical transmitters, fiber, couplers, attenuators, splitters, transceivers, and receivers) a fiber optic communication link will be designed involving time-division multiplexing for eight data channels.

Linux RAID Server

Logical Volume Management and a RAID system (Random Array of Inexpensive Disks) was studied for a Linux server employing the use of NFS and Samba for both Linux and Windows file systems.

08/03 - Date **Senior Design Projects**

2016 Senior Design Projects

Torque Vectoring Vehicle

Embedded Systems and Motor Control of a Torque Vectoring Vehicle

GPS-Denied Formation Control Methodologies in Autonomous Aerial Systems

Hexacopter Swarm Project in a GPS Deprived Environment

Targeted Light Blocking Glasses

Adaptive Light Blocking Glasses for High Intensity Sources

Bi-Directional Power Protection

Bi-Directional Power Protection System for the Smart Grid

Single-Phase Active Harmonic Filter

Single-Phase Active Harmonic Filter for Power Grid Applications

Small Scale Maglev Train System

Development and Demonstration of a Small Scale Maglev Train System

Solar Powered Air Conditioning Unit for Stationary Vehicles

Automated Solar Powered Air Conditioning Unit for Stationary Vehicles

2013 Senior Design Projects

LED Array with Auto Calibration

Dynamic Control of a 2D LED Array with Auto Color Calibration

Dual Axis Auto-Stabilizing Turret

Feedback Control of a Dual Axis Auto-Stabilizing Turret

Night Vision Intruder Detection System
Web Controlled Night Vision Intruder Detection System

Optics Laboratory Experiments
Implementation of Formal Optical Engineering Laboratory Experiments

Adding Subsystems to the Existing UAS
Integration of a Tachometer, Laser Range Finder, and Lighting into the UAS

2010 Senior Design Projects

Sensor Fusion and Integration for the UAV Project
$65,000 awarded to developing an Atto-Pilot System, Sonar Range Detector, and Angle-of-Attack Sensor, which will allow for Semi-Autonomous Flight for the UAV Project

IEEE RFID Library Tagging System
$20,000 awarded to creating an RFID tagging system for the IEEE Library

High-Intensity LED Lighting System
$2,000 awarded to creating a high-intensity LED lighting system

Automatic Guitar Tuner
Automatic guitar tuner capable of tuning a guitar to within 0.01 Hz (< 5 centitones)

Autonomous Walking Robot
Control systems applied to a robot to achieve autonomous walking

2008 Senior Design Projects

The Wait Mate E-Team Project*
Wireless Restaurant Pager System

*2nd Place in the Business Plan Competition at InterProfessional Projects Day (IPRO) Competition

Speech Enhancement Headphones*
Speech Enhancement Headphones using the LMS Algorithm

*1st Place in the College of Engineering's Senior Project Day Competition

Force Feedback with Motor Controls
Force Feedback with Motor Control

VARC E-Team Project*
Voice Activated Remote Control

*1st Place in the Spring 2008 IEEE Region 6 Design Competition

Autonomous Thermal Imaging Flight System
Autonomous Thermal Imaging Flight System*

*3rd Place in the College of Engineering's Senior Project Day Competition

2006 Senior Design Projects

Database-Driven Online Application System*

Secure Online Application System for the Nursing Department

*Now being implemented within multiple California State Universities

Digital Audio Multiplexer

Fiber-Optic Digital Audio Multiplexer

Four-Wheel Drive Traction Control

Digital Four-Wheel Drive Traction Control System with Feedback

Surround Sound Monitor

Digital Surround Sound Meter using a BLACKfin DSP Processor

Traffic Light Controller

Traffic Light Controller with Emergency Override

2005 Senior Design Projects

Embedded Sensor, Ethernet-Based Greenhouse

Ethernet-Based Embedded Systems Environment for a Greenhouse

Redesigning the Hero 1 Robot

Redesign of the Hero 1 Robot for Autonomous Movement

Tactile Remote Steering

Tactile Remote Steering with Force Feedback Control

Tracking Objects with Sensors

Remote Sensing and Tracking with Acoustics and Video

University of Colorado – Boulder, CO

01/98 - 08/03 **Graduate Research Assistant**

Novel Contributions:

- Experimentally demonstrated simultaneous adaptive beam forming and jammer nulling for large fractional bandwidth RF signals at 1 GHz center frequencies using optical signal processing and the BEAMTAP algorithm.

- Designed and implemented a unique phase stabilization system for cohering the phase of the optical beams in the BEAMTAP system.

- Implemented a photorefractive wide-angular aperture, polarization-angle multiplexing scheme in $BaTiO_3$ for read-write isolation of the diffracted hologram.

- Corrected theory to the parallel-tangents, equal-curvature condition for wide-angular aperture diffracted readout in $BaTiO_3$.

- Experimentally demonstrated broadband electron and hole detection with a traveling-fringes detector employing inherent time delay.

- Experimentally demonstrated 50% fractional bandwidth impedance matching at 1 GHz using a transimpedance amplifier, hybrid coupler, and microstrip design.

Rose-Hulman Institute of Technology – Terre Haute, IN

Applied Optics Laboratory Research

08/96 - 10/96   Built a 4f Fourier transform optical processor using holographic transmission gratings as focusing elements. Studied diffraction efficiency, magnification, resolution, and aberrations. Demonstrated simple optical image processing.

03/96 - 06/96   Built a monochromator using a transmission grating and achromatic lenses as collimating and focusing elements. Analysis of the accuracy, efficiency, angular dispersion, linear dispersion, and resolving power were provided.

Undergraduate Researcher

12/95 - 02/96   Researched the theoretical background and principles of fiber-optic gyro-
03/95 - 06/95   scopes. Performed experimental work using fiber optics.

VII. Additional Educational/Research Experience

University of Colorado – Boulder, CO   (ECE & Physics Departments)

Optical Properties of Materials
Study of superlattices, minibands, and strained superlattice structures.

Semiconductor Materials and Devices
Review of work on modeling of the optical properties of MQW modulators in InGaAsP.

RF/Optical Techniques
Optical and microwave comparison of 1-D spatial and temporal soliton propagation.

Radar and Remote Sensing
Design of a simple radar system to detect cloud heights.

Optoelectronic System Design
Design of a three-element zoom lens system.

Laser Physics
Study of Diode-pumped frequency doubled CW Nd:YVO$_4$ lasers.

Fourier Optics
Beam propagation of an RF single-sideband modulated optical signal through a 4f system.

Photorefractive Materials
Gain and stability analysis of a photorefractive circuit.

VIII. Honors and Awards/Scholarships

Academic Honors and Awards

Fall 2016   **CSU Wang Family Excellence Award Nomination**
The Wang Family Excellence Award recognizes four outstanding faculty members and one outstanding staff member who, through extraordinary commitment and dedication, have distinguished themselves by exemplary contributions and achievements. Their activities advance the California State University's mission, bring benefit and credit to the CSU, and enhance the CSU's excellence in teaching, scholarship and service.

Spring 2012   **Provost's Distinguished Achievement in Assessment of Learning**
This honor was given to the faculty of the Electrical and Computer Engineering Department by the Provost for Distinguished Achievement in Assessment of Learning Spring 2012. The award is designed to honor and recognize an academic program's achievements in learning outcomes assessment, showing evidence of sustained learning assessment activities beyond accreditation or program review compliance and providing breadth and depth of assessment activities.

Fall 2010   **Commander Naval Air Forces (CNAF) Distinguished Visitor Program**
This honor was given to me by the United States Navy as part of the CNAF Distinguished Visitor Program, which allowed me to experience a trap landing and catapult takeoff on the USS Ronald Reagan Supercarrier (CVN-76). As part of the trip, I spent 24 hours on the USS Ronald Reagan off the coast of Mexico and California as the carrier conducted flight operations and pilot qualifications, in preparation for deployment for service overseas.

Summer 2010 **EAFB F-22 Raptor Combined Test Force UAV Research Award**
This award was presented to the LCOE UAV Flight Demonstration Team for dedication and encouragement toward the advancement of aircraft, aerospace, and flight test relating to the development and education in UAV technology by Edwards Air Force Flight Test Center's F-22 Raptor Combined Test Force.

Spring 2009   **Lyles College of Engineering Teacher of the Year Award**
This award is given by the Lyles College of Engineering at California State University, Fresno in recognition of the most outstanding teacher within the college.

Spring 2008   **Certificate of Recognition for Outstanding Student Advisor**
This award is given by the IEEE student branch at California State University, Fresno for exemplary hard word and outstanding dedication to the student body as branch counselor.

Fall 2007   **Provost's Award for Excellence in Teaching and Scholarship**
This award is given by the Provost to recognize outstanding performance in Teaching and Scholarship Activities.

Summer 2007 **Nominated for the Mac Van Valkenburg Early Career Teaching Award**
The purpose of this award is to recognizer members of the IEEE Education Society who have made outstanding contributions to teaching unusually early in their professional careers.

2006 - 2007   **Featured on the 2006 - 2007 Academic Calendar**
The purpose of the calendar was to highlight :some of our outstanding faculty who are making significant contributions to students by including them in their research projects".

Spring 2006 **Nominated for the Promising New Faculty Award**
The purpose of this award is to recognize exemplary achievements in teaching, research/creative activities and/or service among all non-tenured, tenure track faculty.

Spring 1997 **Gene M. Bennett Award for Excellence in Applied Optics**
This award is given to the best senior undergraduate student in Applied Optics as determined by the faculty of the Department of Physics and Applied Optics each year. Only one award is given per year.

Spring 1997 **Paul N. Bogart Scholar**
This award is given to the senior undergraduate student(s) with the highest cumulative GPA at the end of their undergraduate career.

Spring 1997 **Sigma Pi Sigma Physics Honorary**
This award is bestowed upon physics and applied optics students who have maintained a high degree of excellence in their undergraduate physics/applied optics courses as an undergraduate.

Spring 1996 **Heminway Scholar**
This award is given to the junior undergraduate student(s) who have maintained the highest cumulative GPA at the end of three years.

1993 - 1997   **Rose-Hulman Honor's List 12/12 Quarters**
A student who is enrolled for at least 45 graded hours in a given academic year and who completes that year with a grade point average of 3.300 or more shall be awarded Class Honors for that year.

Academic Scholarships

1999 - 2002   **National Defense Science and Engineering Graduate Fellowship**
The NDSEG Fellowship Program is a joint program of the United States Army, Navy, and Air Force within the University Research Initiative (URI), designed to increase the number of U. S. citizens trained in the disciplines of science and engineering important to defense goals. Very few fellowships are awarded per year, and the award is considered one of the top graduate fellowships in engineering.

1997 - 1998   **University of Colorado Fellowship**
One year graduate fellowship awarded for excellence in undergraduate studies by the University of Colorado for a select number of incoming first year graduate students.

1995 - 1996   **Rose-Hulman Presidential Scholarship**
Undergraduate scholarship awarded by the president for excellence in course work with respect to the other engineering students attending Rose-Hulman.

1993 - 1994   **Rose-Hulman Scholarship**
Undergraduate scholarship awarded by Rose-Hulman for excellence in course work with respect to other engineering students.

IX. Computer Skills

Operating Systems:	Linux System Administration, Linux (RedHat, Fedora Core, Fedora), Unix, Windows, DOS
Programming Languages:	C/C++, Assembly, Matlab, IDL, Perl, HTML, PHP, Pascal, PBASIC, Maple, Mathematica
Typesetting & IDEs:	Emacs, Latex, Open Office, Microsoft Office; NetBeans, MPLAB/MPLAB X, Kompozer
Other Programs:	Apache, Dovecot, Enlightenment, Fetchmail, Git, Joomla, phpBB, MediaWiki, MySQL, NFS, RPM, Rsync, Samba, SELinux, Sendmail, SSH, SVN, VirtualBox, etc.

X. Professional Society Activities

AUVSI Member – Association for Unmanned Vehicle Systems International

IEEE Member – The Institute of Electrical and Electronics Engineers
    Advisor for the IEEE Student Chapter – California State University, Fresno
    Advisor for the HKN Student Chapter – California State University, Fresno

OSA Member – The Optical Society of America

SPIE Member – The International Society for Optical Engineering
    SPIE Advisor for High School Teachers – Fresno District

Editor for John Wiley & Sons, Inc. – "The Handbook of Computer Networks"
Book Chapter – Optical Solitons

Editor for Pearson Higher Education – "DSP First"
by Jim McClellan, Ron Schafer, and Mark Yoder

Editor for Pearson Higher Education – "Interactive Control Systems"
by Greg Mason

XI. Refereed Publications, Technical Reports, and Interviews

Book Chapters

1. G. R. Kriehn and K. Wagner, "True-time-delay adaptive array processing using photorefractive crystals," *Photorefractive Materials and Applications (Vol. III)*, pp. 135-168, 2006.[*]

[*]Invited Book Chapter, submitted, accepted, and published in *Springer Series in Optical Sciences: Photorefractive Materials and Applications (Vol. III)* in 2006.

Refereed Publications

1. G. Kriehn, J. Flerchinger, A. Lopez, V. Urbieta, E. Combs, T. Pittenger, T. Courrejou, J. Cook, and C. Yam, "Unmanned Aerial Vehicle Laser Targeting System", AUVSI's Unmanned Systems North America 2010, AUVSI, August 2010.

2. G. Kriehn and K. Wagner, "Photorefractive-Based Adaptive Antenna Array Processing using BEAMTAP," *Controlling Light with Light: Photorefractive Effects, Photosensitivity, Fiber Gratings, Photonic Materials and More (PR)*, OSA, October 2007.

3. M. Colice, R. T. Weverka, G. Kriehn, F. Schlottau, and K. Wagner, "Holographic Method of Cohering Fiber Tapped-Delay-Lines," *Applied Optics* **44**, pp. 5257-5272, September 2005.

4. G. R. Kriehn and K. Wagner, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas," *Optical Information Systems II,* SPIE, August 2004.

5. C. M. Colice, T. Weverka, G. R. Kriehn, K. H. Wagner, "Coherent fiber-remoting using phase-cohering holography," *Photorefractive Fiber and Crystal Devices: Materials, Optical Properties, and Applications IX,* SPIE, August 2004.

6. A. Kiruluta, G. S. Pati, G. Kriehn, P. E. X. Silveira, A. W. Sarto, and K. Wagner, "Spatio-temporal operator formalism for holographic recording and diffraction in a photorefractive-based true-time-delay phased-array processor," *Applied Optics* **42**, pp. 5334-5350, September 2003.[†]

[†]Featured on the cover of *Applied Optics*.

7. G. Kriehn, F. Schlottau, and K. Wagner, "Optically-Implemented 2-D Beam Steering and Jammer Nulling using BEAMTAP," In *Optical Computing*, SPIE, (Taipei, Taiwan) April 2002.

8. Kelvin H. Wagner, Greg Kriehn, and Friso Schlottau, "Wideband All-Optical BEAMTAP," In *The International Topical Meeting on Microwave Photonics*, IEEE, October, 2001.

9. G. Kriehn and K. Wagner, "Experimental Adaptive Beam Forming with Polarization Read-Write Multiplexing using BEAMTAP," In *The International Topical Meeting on Microwave Photonics*, IEEE, October, 2001.

10. G. Kriehn, F. Schlottau, G. S. Pati, and K. Wagner, "Demonstration of RF Photonic Beam Forming using the BEAMTAP Algorithm," In *Optical Computing*, SPIE, January 2001.

11. G. Kriehn, G. S. Pati, P. E. X. Silveira, F. Schlottau, and K. Wagner and D. Dolfi, "Demonstration of optical beam forming using BEAMTAP," In *International Workshop on Photonics for Antennas'*, Invited Paper at The International Topical Meeting on Microwave Photonics MWP 2000, (Oxford, United Kingdom) September, 2000.

12. G. R. Kriehn, P. E. X. Silveira, G. S. Pati, F. Schlottau, and K. H. Wagner, "BEAMTAP RF-photonic adaptive-array processing," In *Interactions between Microwaves and Optics*, OMW 3rd International Summer School, (Autrans, France) August 2000.

13. G. Kriehn, G. S. Pati, P. E. X. Silveira, F. Schlottau, S. Weaver, and K. Wagner, "Experimental demonstration of broadband adaptive beam forming using the BEAMTAP algorithm," In *Proceedings of The Tenth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, PSAA-10, February 2000.

14. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, S. Kraut, K. Wagner, R. T. Weverka, and L. Griffiths, "Optical BEAMTAP beam-forming and jammer-nulling system for broadband phased-array antennas," *Applied Optics* **39**, pp. 212-230, January 2000.[‡]

[‡]Featured on the cover of *Applied Optics*.

15. K. H. Wagner, G. R. Kriehn, and P. E. X. Silveira, "RF-Photonic Adaptive-Array Processing," In *National Radio Science Meeting*, URSI, p. 238, January 2000.

16. K. H. Wagner, G. R. Kriehn, P. E. X. Silveira, "Photorefractive adaptive phased-array processor," In *LEOS Newsletter*, IEEE Lasers and Electro-Optics Society, pp. 17-18, October 1999.

17. K. H. Wagner, G. R. Kriehn, A. J. M. Kiruluta, and P. E. X. Silveira, "RF-Photonic Adaptive Array Processing," In *COLOQ'6*, Invited Paper at SFO Horizons d'optique, (Bordeaux, France) September 1999.

18. P. E. X. Silveira, G. Kriehn, A. Kiruluta, S. Weaver, K. H. Wagner, and R. T. Weverka, "All-optical antenna array adaptive processing system," In *Radar Processing, Technology, and Applications IV*, Proc. SPIE, **3810** pp. 16-26, July 1999.

19. G. Kriehn, A. M. Kiruluta, K. H. Wagner, D. Dolfi, and J.-P. Huignard, "Detection and time delay of a broadband RF signal using a traveling fringes detector," In *Terahertz and Gigahertz Photonics*, Proc. SPIE, **3795** July 1999.

20. A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and K. Wagner, "Adaptive beamforming with TDI CCD based true-time-delay processing," In *Algorithm, Devices, and Systems for Optical Information Processing III*, Proc. SPIE, **3804** July 1999.

21. K. H. Wagner, G. Kriehn, P. E. X. Silveira, A. Kiruluta, and S. Weaver, "Photorefractive BEAMTAP RF Beamforming System," In *Seventh Topical Meeting on Photorefractive Materials, Effects, and Devices*, OSA, (Elsinor, Denmark) June 1999.

22. A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and K. H. Wagner, "Operator notational analysis of a photorefractive phased array processor," In *Optics in Computing Technical Digest*, OSA, pp. 170-172, April 1999.

23. K. Wagner, A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and T. Weverka, "Photorefractive-based true-time-delay phased array processing," In *Photonics and Phased Array Systems (PAPAS) (SPIE's International Technical Group Newsletter Optical Processing and Computing)*, SPIE, pp. 5,10, April 1999.

24. G. Kriehn, P. E. X. Silveira, K. H. Wagner, A. Kiruluta, and S. Weaver, "All-optical BEAM-TAP beamforming system," In *Proceedings of the Ninth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, PSAA-9, February 1999.

25. A. Kiruluta, P. E. X. Silveira, G. Kriehn, S. Weaver, and K. Wagner, "Photorefractive phased array beamforming with true-time-delay processing," In *International Topical Meeting on Microwave Photonics Technical Digest (including High Speed Photonics Components Workshop)*, IEEE, pp. 103-106, October 1998.

26. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Imaging analysis of photorefractive phased array beamforming," In *Radar Processing, Technology, and Applications III*, Proc. SPIE, pp. 196-208, July 1998.

Technical Reports and White Papers

1. K. Cartier, G. Leyva, R. Runyon, D. R. Coulibaly, "Ocular Forces of Ovis Aries on Homo Sapiens' Orbit in Microgravity", NASA, May 2013.[*]

[*]Report and experimentation guided by Dr. Gregory R. Kriehn for NASA.

2. G. R. Kriehn, J. Flerchinger, A. Lopez, V. Urbieta, E. Combs, T. Pittenger, T. Courrejou, J. Cook, and C. Yam, "CSUF UAV Phase II Final Report", Edwards Air Force Base, December 2010.

3. G. Kriehn, W. Mizuno, N. Bengiamin, G. Happawana, "CSUF UAV Phase I Final Report", Edwards Air Force Base, December 2010.

4. J. Wyss, M. Grace, B. Norvell, K. Wagner, and G. Kriehn, "A Broadband Photonic Spatio-Temporal Adaptive Processor for Beam Forming and Jammer Nulling in Large Phased Arrays", *Air Force Research Laboratory*, BAA 09-02-RAKI, March 2009.

5. G. R. Kriehn and A. Siahmakoun, "Optical Dynamic Spectrum Access", *Wright-Patterson Air Force Base*, August 2008.

6. K. Wagner and G. Kriehn, "Efficient TTD multiple beamforming for 2-D antenna arrays using traveling-fringe detector time delay", *Defense Advanced Research Projects Agency (DARPA)*", April 2008.

7. J. Wyss, M. Grace, K. Wagner, and G. Kriehn, "BEAMTAP: An All-Optical Adaptive Signal Processor for Beam Forming and Jammer Nulling", February 2008.

Television, Newspaper, and Web Interviews, Reports, and Articles

1. "SSU Program Trains Teachers on Drones and Rockets", *Sonoma State University Newsletter*, Web Article, July 2016.

2. "The 16 Best Drone Universities", *Dronethusiast*, Web Interview, April 2016.

3. "Fresno State Using Drones for Valley Agriculture", *Fresno State Interview for Fox 26 News*, Television, October 2014.

4. "Unmanned Aircrafts: A Future for the Agriculture Industry", *The Collegian at Fresno State (Fresno, CA)*, Newspaper, September 2014.

5. "Jordan Research Groundbreaking", *Fresno State Interview for CBS 47*, Television, June 2014.

6. "Drone Documentary", *Fresno State Interview for Valley PBS (Fresno, CA)*, Television, March 2014.

7. "High Tech Drones for Ag", *UC Merced Sierra Nevada Research Institute*, Web Interview, April 2013.

8. "Special Report: High-Tech Drones for Ag", *CBS 47 News (Fresno, CA)*, Television, April 2013.

9. "Unmanned Aerial System has High Possibilities", *Fresno State University Journal (Fresno, CA)*, Online Journal, March 2013.

10. "Drone Resolution Passed by ASI", *The Collegian at Fresno State (Fresno, CA)*, Newspaper, March 2013.

11. "UAV's Coming to Fresno", *CBS 47 News (Fresno, CA)*, Television, February 2013.

12. "Students Create Unmanned Aerial Vehicle", *The Collegian at Fresno State (Fresno, CA)*, Newspaper, November 2011.

13. "Fresno State Students Build a Drone", *KSEE 24 News*, Television, July 2010.

14. "Profiles on Excellence – Unnamed Aerial Vehicle (UAV) Project at Fresno State", *eCURRENTS (Fresno, CA)*, Summer 2010.

15. "Fresno State Students Build Unmanned Aircraft", *The Fresno Bee (Fresno, CA)*, Newspaper, June 2010.

16. "Sky's the Limit for Engineering Students with Unmanned Aerial Vehicle", *FresnoState-News.com (Fresno, CA)*, Online Newspaper, November 2009.

17. "Engineers for People", *The Collegian at Fresno State (Fresno, CA)*, Newspaper, April 2008.

XII. Conference and Professional Presentations

Professional Conference Presentations

1. G. Kriehn, "Remote Sensing & Aerial Imaging", *WPHA Nutrient & Professional Development Seminar*, November 2016. **Two Invited Talks**

2. G. Kriehn, "Fresno State Unmanned Aerial Systems", *International Drone Conference*, December 2015. **Invited Talk**

3. G. Kriehn, "UAV Technology in Pest Management", *Continuing Education for Pest Management Professionals*, March 2016. **Invited Talk**

4. A. Castilo, A. Lopez, A. Pandey, P. Verrinder, G. Kriehn, "Agricultural Applications of Unmanned Aerial Systems for Crop Monitoring", *Central California Research Symposium*, April 2015.

5. G. Kriehn, "UAV Technology in Pest Management", *Continuing Education for Pest Management Professionals*, March 2015. **Invited Talk**

6. G. Kriehn, "Unmanned Aerial Systems at Fresno State", *NASA Ames California Space Grant Consortium*, March 2014.

7. G. Kriehn, "Unmanned Aerial Systems Imaging Research", *Continuing Education for Pest Management Professionals*, October 2013. **Invited Talk**

8. G. Kriehn, J. Flerchinger, and T. Pittenger, "Unmanned Aerial Vehicle Laser Targeting System", *AUVSI's Unmanned Systems North America 2010*, August 2010.

9. H. Delcore and G. Kriehn, "Interdisciplinary Innovation Teams in Anthropology, Business, and Engineering", *CETL Conference*, March 2009.

10. G. Kriehn and K. Wagner, "Photorefractive-Based Adaptive Array Processing using BEAM-TAP", *OSA's Controlling Light with Light: Photorefractive Effects, Photosensitivity, Fiber Gratings, Photonic Materials and More (PR)*, October 2007.

11. G. Kriehn, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas", *SPIE's 49th Annual Meeting and Exhibition*, August 2004.

12. G. Kriehn, F. Schlottau, and K. Wagner, "Optically-Implemented 2-D Beam Steering and Jammer Nulling using BEAMTAP," *Optical Computing*, April 2002.

13. G. Kriehn, F. Schlottau, G. S. Pati, and K. Wagner, "Demonstration of RF Photonic Beam Forming using the BEAMTAP Algorithm," *Optical Computing*, January 2001.

14. G. Kriehn, F. Schlottau, G. S. Pati, P. E. X. Silveira, and K. Wagner, "Optical BEAMTAP Beam-Forming and Jammer-Nulling System for Broadband Phased-Array Antennas," *Third Annual OSD MURI Review on RF Photonics for Array Processing*, October 2000.

15. G. Kriehn, G. S. Pati, P. E. X. Silveira, F. Schlottau, S. Weaver, and K. Wagner, "Experimental Demonstration of Broadband Adaptive Beam Forming using the BEAMTAP Algorithm," *Tenth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, February 2000.

16. K. H. Wagner, G. R. Kriehn, and P. E. X. Silveira, "RF-Photonic Adaptive-Array Processing," *National Radio Science Meeting*, January 2000.

17. G. Kriehn, P. E. X. Silveira, G. S. Pati, F. Schlottau, S. Weaver, and K. Wagner, "Optical BEAMTAP beam-forming and jammer-nulling system for broadband phased-array antennas," *Second Annual OSD MURI Review on RF Photonics for Array Processing*, December 1999.

18. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Optical beamforming and jammer nulling system for phased array antennas," *Optoelectronic Computing Systems Center Retreat*, November 1999.

19. A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and K. Wagner, "Adaptive beamforming with TDI CCD based true-time-delay processing," In *SPIE's 44th Annual Meeting and Exhibition*, July 1999.

20. G. Kriehn, A. M. Kiruluta, K. H. Wagner, D. Dolphi, and J.-P. Huignard, "Detection of a broadband RF signal using a traveling fringes detector," *SPIE's 44th Annual Meeting and Exhibition*, July 1999.

21. G. Kriehn, P. E. X. Silveira, K. H. Wagner, A. Kiruluta, and S. Weaver, "All-optical BEAMTAP beamforming system," *Ninth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, February 1999.

22. G.Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Efficient optical implementation of broadband squint-free true-time-delay beamforming and jammer nulling," *First Annual OSD MURI Review on RF Photonics for Array Processing*, January 1999.

23. G. Kriehn, A. Kiruluta, S. Weaver, and K. Wagner, "Broadband squint-free true-time-delay beam forming using two tapped delay lines," *1998 OSA Annual Meeting and Exhibit*, October 1998.

Other Professional Conferences and Workshops Attended

1. *2013 Fresno State Teaching Innovations Academy*, (Fresno, CA), June 2013.

2. *Department of Energy/Lawrence Livermore National Laboratory Entrepreneurial Seminar*, (Livermore, CA – National), October 2012.

3. *StratoStar Systems Near Space Workshop*, (Sacramento, CA), February 2011.

4. *CENIC '07: Making Waves*, (La Jolla, CA), March 2007.

5. *Grants 101: Professional Grant Proposal Writing Workshop*, (Los Los Angeles, CA), April 2004.

Professional Workshop Presentations

1. *NASA MUREP Community College Curriculum Development Workshop*, (Sonoma State), July 2016.

2. *LCOE Summer Enrichment Workshop: Matlab – Advanced*, (Fresno, CA), August 2013.

3. *LCOE Summer Enrichment Workshop: Matlab – Basic/Introductory*, (Fresno, CA), August 2013.

4. *LCOE Summer Engineering Experience (SEE) Camp*, (Fresno, CA), June, 2013.

5. *STEM Learning in Action Conference*, (Fresno, CA), May, 2013.

6. *STEM 2010 Summer Leadership Institute*, (Three Rivers, CA), July 2010.

7. *Technology Day 2009*, (Fresno, CA), November 2009.

8. *STEM 2009 Summer Institute*, (Fresno, CA), July 2009.

9. *EIT Exam Review Workshop*, (Fresno, CA), Spring 2008.

Professional Research Presentations

1. G. Kriehn, W. Mizuno, G. Happawana, and R. Nunna "CSUF UAS Technical Interchange with Col. John Jordan", *California State University, Fresno*, March 2011.

2. A. Siahmakoun and G. Kriehn, "Optical Dynamic Spectrum Access", *Wright-Patterson Air Force Base*, August 2010.

3. G. Kriehn, W. Mizuno, G. Happawana, "EAFB UAS Project Demonstration II", *Edwards Air Force Base*, June 2010.

4. G. Kriehn, W. Mizuno, G. Happawana, "EAFB UAS Project Demonstration I", *Edwards Air Force Base*, June 2009.

5. G. Kriehn, M. Grace, J. Guerci, J. Wyss, B. Norvell, K. Wagner, G. VanBlaricum, "Revolutionary Optical Processing Systems (RevOPS)", *DARPA*, December 2008.

6. G. Kriehn, "Networking Technology within the United States", *Lyles Center for Innovation & Entrepreneurship – Winter Olympic Delegate Committee from China*, September 2008.

7. G. Kriehn, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas", *Toyon Research Meeting (Boulder, CO)*, May 2007.

8. G. Kriehn, R. Nunna, A. Hoff, *Lancaster University Center*, Spring 2006.

9. G. Kriehn, "Coherent Optical Signal Processing using the Traveling-Fringes Detector and the BEAMTAP Algorithm", *University of Colorado, Boulder (Lockheed Research Meeting)*, July 2004.

10. G. Kriehn, "Coherent Optical Signal Processing for Broadband Phased-Array Antennas using the BEAMTAP Algorithm", *University of Colorado (Dr. Kelvin Wagner's Research Group)*, July 2004.

11. G. Kriehn, "Polarization-Angle, Read-Write Multiplexing using Dynamic Holography", *California State University, Fresno (Physics Colloquium)*, February 2004.

12. G. Kriehn, "Coherent Optical Signal Processing for Broadband Phased-Array Antennas using the BEAMTAP Algorithm," *University of Colorado, Boulder (Ph. D. Thesis Defense)*, May 2003.

13. G. Kriehn, "Coherent Opto-Electronic Signal Processing for Broadband, Phased-Array Antennas," *California State University, Fresno*, April 2003.

14. G. Kriehn, "Coherent Optical Signal Processing for Broadband Adaptive Phased-Array Antennas using the BEAMTAP Algorithm," *University of Colorado, Boulder (Ph. D. Comprehensive Exam)*, May 2002.

Industrial Research Presentations

1. G. Kriehn, "Fresno State UAS Aerovironment Technical Interchange Meeting", *Fresno State*, May 2015.

2. G. Kriehn, W. Mizuno, R. Munjy, A. Alexandrou "Fresno State Paramount Farms Technical Interchange Meeting", *Paramount Farms (Shafter, CA)*, May 2014.

3. G. Kriehn, "Unmanned Aerial Systems Trimble Technical Interchange Meeting", *Fresno State*, February 2014.

4. G. Kriehn and N. Papavasiliou, "Laval Underground Surveys, LLC Technical Interchange Meeting", *Laval Underground Surveys, LLC (Fresno, CA)*, October 2013.

5. G. Kriehn, "LEHKO Innovation Technical Interchange Meeting", *LEHKO Innovation (Fresno, CA)*, June 2013.

6. G. Kriehn, "2D-LED Array Driver for CCD Camera Calibration Technical Interchange Meeting", *Pelco (Fresno, CA)*, May 2013.

7. G. Kriehn and N. Papavasiliou, "Laval Underground Surveys, LLC Technical Interchange Meeting", *Laval Underground Surveys, LLC (Fresno, CA)*, May 2013.

8. G. Kriehn, K. Updyke, and D. Thomas, "Pelco Optical Engineering Technical Interchange Meeting", *Pelco (Fresno, CA)*, January 2013.

9. G. Kriehn, "CSUF UAS Technical Presentation to Alpha Research and Technology", *Alpha Research and Technology (El Dorado Hills, CA)*, November 2011.

10. G. Kriehn and N. Papavasiliou, "Pelco Optical Engineering Technical Interchange Meeting", *California State University, Fresno (Fresno CA)*, September 2011.

11. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (Goleta, CA)*, October 2008.

12. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (FL)*, October 2008.

13. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (Goleta, CA)*, August 2008.

14. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (Goleta, CA)*, June 2008.

15. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (Goleta, CA)*, April 2008.

16. G. Kriehn, "Video Free-Space Communication Link Part 2", *Pelco (Fresno, CA)*, Summer 2007.

17. G. Kriehn, "Optical Free-Space Communication Link Part 1", *Pelco (Fresno, CA)*, Spring 2007.

18. G. Kriehn, "Optical Free-Space Communication Link", *Pelco (Clovis, CA)*, Summer 2006.

19. G. Kriehn, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas," *IPiTEK (Carlsbad, CA)*, Spring 2006.

20. G. Kriehn and R. Nunna, *Motorola (San Jose, CA)*, Spring 2006.

21. G. Kriehn and D. Z. Lucka, "Optical Free Space Communication Links", *Pelco (Clovis, CA)*, February 2005.

22. G. Kriehn, R. Nunna, and D. Z. Lucka, "Future Interaction between California State University, Fresno ,and Pelco", with *Pelco (Clovis, CA)*, November 2004.

23. G. Kriehn, F. Schlottau, G. S. Pati, and K. Wagner, "Demonstration of RF Photonic Beam Forming using the BEAMTAP Algorithm," *General Electric Meeting (Boulder, CO)*, November 2001.

Educational/Colloquium Presentations

1. G. Kriehn, "Technical Complexity and the World We Live In: How to Communicate Effectively in a World Saturated with Noise", *Smittcamp Colloquium, (Fresno, CA)*, February 2016.

2. G. Kriehn, "UAS in Agriculture: The Rise of Hexacopters", *Osher Lifelong Learning Institute (OLLI), (Fresno, CA)*, January 2015.

3. G. Kriehn, "Photorefractive Volume Holography with Read-Write Multiplexing using the Parallel-Tangents, Equal-Curvature Condition", *Physics Colloquium, (Fresno, CA)*, October 2014.

4. G. Kriehn, R. Munjy, and W. Mizuno, "UAS in Agriculture: The Rise of Hexacopters", *The Friends of the Madden Library, (Fresno, CA)*, September 2014.

5. G. Kriehn, "Engineers and Inventions", *Daily Charter Elementary School, (Fresno, CA)*, May 2013.

6. G. Kriehn, "Unmanned Aerial Systems Informational Session", *Fresno State Academic Senate (Fresno, CA)*, February 2013.

7. G. Kriehn, "UAS Research at Fresno State", *Fresno State IEEE Student Chapter Meeting (Fresno, CA)*, September 2012.

8. G. Kriehn, "LCOE Honors Program Husband-Boeing Scholars", *Fresno State President's Fundraiser Presentation (Fresno, CA)*, May 2012.

9. G. Kriehn, G. Happawana, W. Mizuno, M. Mahalik, and N. Bengiamin, "JCAST UAS Technical Presentation", *Fresno State (Fresno, CA)*, December 2011.

10. G. Kriehn, "Electrical and Computer Engineering Presentation," *THEMA Presentation for Tehachapi High School at CSUF, (Fresno, CA)*, May 2010.

11. G. Kriehn, "Electrical and Computer Engineering Presentation," *THEMA Presentation for Tehachapi High School at CSUF, (Fresno, CA)*, May 2009.

12. G. Kriehn, "Interdisciplinary Engineering Communication and the Visual Display of Quantitative Information", *California State University, Fresno Engineering Entrepreneurship Class (Fresno, CA)*, November 2008.

13. G. Kriehn, "Electrical and Computer Engineering Presentation," *THEMA Presentation for Tehachapi High School at CSUF, (Fresno, CA)*, May 2008.

14. G. Kriehn, "Linux Workshop II," *California State University, Fresno IEEE Workshop (Fresno, CA)*, April 2008.

15. G. Kriehn, "Tri-Color LED Circuit," *California State University, Fresno IEEE Student Chapter Meeting (Fresno, CA)*, April 2008.

16. G. Kriehn, "Graduate Workshop," *California State University, Fresno IEEE Workshop (Fresno, CA)*, March 2008.

17. G. Kriehn, "Linux Workshop I," *California State University, Fresno IEEE Workshop (Fresno, CA)*, February 2008.

18. G. Kriehn, "THEMA Engineering Presentation," *Tehachapi High School (Tehachapi, CA)*, December 2008.

19. G. Kriehn, "LaTeX Workshop," *California State University, Fresno IEEE Workshop (Fresno, CA)*, October 2007.

20. G. Kriehn, "Critical Thinking," *California State University, Fresno The Thinker's Club at the Distance Learning Center (Fresno, CA))*, April 2005.

21. G. Kriehn, "Lasers and Holography," *California State University, Fresno IEEE Student Chapter Meeting (Fresno, CA)*, October 2004.

22. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Optical beamforming and jammer nulling system for phased array antennas," *Rose-Hulman Institute of Technology*, May 1999.

XIII. Poster Presentations

1. T. Zhao, G. Kriehn, A. Ray, Y. Q. Chen, L. Burrow, and D. Doll, "Evaluating and Extending the Use of Small Unmanned Aerial Vehicles (UAVs) as a Crop Monitoring Tool", *UC ANR CI Conference*, October 2015.

2. G. R. Kriehn, J. Flerchinger, A. Lopez, V. Urbieta, E. Combs, T. Pittenger, T. Courrejou, J. Cook, and C. Yam, "Unmanned Aerial Vehicle Laser Targeting System", *AUVSI's Unmanned Systems North America 2010*, August 2010.

3. G. Kriehn and K. Wagner, "Experimental Demonstration of Adaptive Phased-Array Signal Processing," *Colorado Photonics Industry Association*, November 2002.

4. G. Kriehn and K. Wagner, "Experimental Adaptive Beam Forming with Polarization Read-Write Multiplexing using BEAMTAP," In *The International Topical Meeting on Microwave Photonics*, IEEE, October, 2001.

5. G. Kriehn, "Optical Phased Array Signal Processing," *Colorado Photonics Industry Association*, November 2001.

6. G. Kriehn, "Optical Phased Array Signal Processing," *Optoelectronic Computing Systems Center Retreat*, April 2001.

7. G. Kriehn, "Broadband Detection with a Traveling Fringes Detector," *Optoelectronic Computing Systems Center Retreat*, November 1999.

8. G. Kriehn, "Adaptive Array Processing," *Optoelectronic Computing Systems Center Retreat*, 1998.

9. A. Kiruluta, G. Kriehn, P. Silveira, S. Weaver, S. Kraut, and K. Wagner, "Broadband Efficient Adaptive Method for True-Time-Delay Array Processing," In *IEEE International Topical Meeting on Microwave Photonics*, IEEE, (Princeton, NJ), October 1998.

XIV. Non-Refereed Papers/Presentations

1. W. E. Rice and G. Kriehn, "Developing Advisory Teams for Managers," for *World Business Development Conference, India*, 2004.

2. W. E. Rice, S. Geringer, and G. Kriehn, "Pedagogy Revisited: Teaching Style versus Learning Style", for *World Business Development Conference, Thailand*, January 2005.

XIV. University and Professional and Service

Electrical and Computer Engineering Departmental Committees & Responsibilities

1. ECE Graduate Coordinator (2007 - 2008)
2. ECE Graduate Project Thesis Committees (2003 - Date)
3. ECE Search Committees (2003 - Date)
4. ECE RTP/WPAF Committees (2012 - Date)
5. ECE Graduate Committee (2003 - Date)
6. ECE Departmental Dog Days Events (2007 - Date)
7. ECE Sabbatical Review Committee (2012, 2015)
8. ECE Range Elevation Committee (2011)
9. ECE ABET Assessment (2003 - Date)
10. ECE Peer Evaluations (2003 - Date)
11. ECE Faculty Mentor

Lyles College of Engineering Committees & Responsibilities

1. LCOE Honors College Director (2009 - Date)
2. LCOE Honors Council (2008 - Date)
3. LCOE Computer Committee (2008 - Date)
4. LCOE Graduate Committee (2005 - 2010)
5. LCOE Research Committee (2005 - 2011)
6. LCOE Innovations Committee (2013 - Date)
7. LCOE Consultative Body Secretary (2005 - 2006)
8. Ad Hoc Mechatronics Steering Committee (2011 - 2013)

University, System-Wide Committees & Service

1. University Academic Senator (2012 - 2015)
2. University Patent Review Board Member (2006 - Date)
3. University Honors Council (2016 - Date)
4. University Graduate Committee (2005 - 2009)
5. University Professional Development Subcommittee (2005 - 2007)
6. University Drone Task Force (Co-Chair) (2016 - Date)
7. Q-DOGS Qualities of a Fresno State Graduate Student Task Force (2006-2008)
8. President's Forum (2013)

Professional and Community Service Activities

1. **IEEE Student Chapter Advisor (2005 - Date)** – I have served as the IEEE Student Chapter Advisor since Spring 2005. Responsibilities include helping coordinate and host IEEE Region 6 Conferences, interfacing the student chapter with industry, bringing external speakers to campus, promoting Electrical and Computer Engineering ethics and education, participating in engineering tours, and mentoring students in IEEE student design and paper competitions.

2. **Hosted IEEE Central Area Meeting for Region 6 (Fall 2008; Spring 2006)** – Along with the IEEE Student Branch and Dr. Nunna, I helped organize and host the IEEE Central Area Meeting for Region 6 Fall 2008 and Spring 2006. The meetings included a business meeting of the section officers, provided IEEE student officers with leadership training, and IEEE student branch micromouse, design, and paper contests.

3. **LCOE Honors Projects (2009 - Date)** – Each semester LCOE Honors students participate in Professional Community Service Activities, typically in conjunction with local and regional elementary, middle, and high schools. Under my direction and preparation, LCOE Honors Students have organized field trips with the major's Professional Student Societies, demonstrated engineering concepts to local and regional schools, presented at the LCOE Open House, helped teach engineering workshops, and promote STEM education.

4. **Liaison for Tehachapi High School Engineering Program (2007 - 2010)** – I served as a liaison for Tehachapi High School's Engineering Program, and collaborated with Tehachapi High School to encourage students interested in engineering to attend Fresno State. I visited Tehachapi High School in December 2007, and hosted their THEMA students May 2008 during the LCOE Senior Project Day.

5. **SPIE Advisor for High School Teachers in the Fresno District (2005 - 2010)** – I volunteered for the educational program "Hand-On Optics" in Fresno, to work with future teachers interested in Optics.

6. **Optical Consultant for City of Fresno (2003 - 2004)** – I volunteered my professional optics services to the City of Fresno to establish proper lighting luminance for LED signs located on the southwest corner of Herndon and Palm Avenues.

7. **Elementary/Charter/Co-Operative STEM Education** – I have volunteered at various elementary, charter and co-op schools in Fresno to teach elementary students about STEM.

8. **STEM Summer Institutes (Summer 2009; Summer 2010)** – I have been involved in a collaborative effort between the Kremen School of Education, the Mathematics Department, and the Lyles College of Engineering to create two STEM Summer Institutes. Feedback from K-12 teachers, and the Director Karen Arth was extremely positive.

Special Collegial and Collborative Relations

1. **LCOE Convocation Ceremony Emcee (Spring 2007 - Date)** – Since 2007, I have served as the Master of Ceremonies for the Lyles College of Engineering Graduation Convocation each spring semester. To help bring a sense of festivities to the convocation ceremony, I have choreographed the entire ceremony to music, and typically use a 64 tricolor LED graduation cap that I created several years ago. Each year students and parents thank me for providing their family with "the best graduation ceremony"they have ever attended. Clips of the LED graduation cap have hit YouTube, and can be found at:

   http://www.youtube.com/watch?v=_zw3HSl3nmc

   http://www.youtube.com/watch?v=9kqsU1bWjNA

2. **Linux Systems Administration and the Kriehn Repository (2003 - Date)** – Since 2003 I have hosted Linux Systems Administration web pages and the "Kriehn Repository" to serve the world-wide community for Linux RPM based distributions. This has become and important service to the community over the years, as I have brought official packages into the Fedora Linux Distribution, helped debug security problems in OpenSSH (the current standard for establishing encrypted communications between computers), and provided supplemental packages to the Linux community. Over the years, K-12, College, and Industrial IT Systems Administrators, as well as faculty and governmental researchers, have thanked me for contributions to the Linux, Open-Source Community. Further information can be found at:

   https://optics.csufresno.edu/index.php/fedora-linux/fedora-linux-overview

3. **Meeting with a Chinese Delegation for the Winter Olympics (Fall 2008)** – During Fall 2008 I met with a Chinese Delegation from Harbin Engineering University to discuss networking trends within the United States, the purpose of which was to help the delegation prepare for their Winter 2010 Olympic bid. Having lived 6 years in Taiwan, I was able to communicate effectively with the delegation in both English and Mandarin.

4. **Room and Board for a Nepali Student** – My wife and I provided free room and board for an international student between Fall 2008 and Spring 2011 to help with her education at Fresno City College. She successfully completed her Associate Degree in Nursing, and is currently practicing as a registered nurse in Fresno.